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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/037,966	12/21/2001	Oskar J. Painter	CQC14NP	7507

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EXAMINER

VALENCIA, DANIEL E

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 02/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/037,966

Applicant(s)

PAINTER ET AL.

Examiner

Daniel E Valencia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-139 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 1-139 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-74, drawn to an optical device, classified in class 385, subclass 49.
- II. Claims 75-100, drawn to an optical modulator, classified in class 385, subclass 1.
- III. Claims 101-112, drawn to an optical switch, classified in class 385, subclass 16.
- IV. Claims 113-124, drawn to a resonant optical device, classified in class 385, subclass 50.
- V. Claims 125-139, drawn to a method of fabricating a multi-layer laterally confined dispersion engineered optical waveguide structure, classified in class 427, subclass 163.2.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different modes of operation. For example, Invention I operates under the principle of coupling an optical device component to a waveguide. On the other hand, Invention II operates under the principles of splitting an optical signal, while varying modal index in the intermediate waveguide, then recombining the signals in order to produce a constructive or destructive interference resulting in modulation.

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interference resulting in modulation. On the other hand, Invention III operates as an optical switch responding to a control signal that dictates the amount of optical signal coupled to the first or second waveguides.

Inventions II and IV are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different modes of operation. For example, Invention II operates under the principles of splitting an optical signal, while varying modal index in the intermediate waveguide, then recombining the signals in order to produce a constructive or destructive interference resulting in modulation. On the other hand, Invention IV operates as a resonant device having a control signal to a resonant frequency.

Inventions III and IV are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different modes of operation. For example, Invention III operates as an optical switch responding to a control signal that dictates the amount of optical signal coupled to the first or second waveguides. On the other hand, Invention IV operates as a resonant device having a control signal to and a resonant frequency.

Inventions V and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case, the product of Invention I could have been made using sputtering, epitaxial growth, and/or other coating techniques.

Inventions II and V are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different modes of operation. For example, Invention II operates under the principles of splitting an optical signal, while varying modal index in the intermediate waveguide, then recombining the signals in order to produce a constructive or destructive interference resulting in modulation. On the other hand, Invention V operates by depositing waveguide material to form a dispersion-engineered waveguide.

Inventions III and V are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different modes of operation. For example, Invention III operates as an optical switch responding to a control signal that dictates the amount of optical signal coupled to the first

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or second waveguides. On the other hand, Invention V operates by depositing waveguide material to form a dispersion-engineered waveguide.

Inventions IV and V are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different modes of operation. For example, Invention IV operates as a resonant device having a control signal and a resonant frequency. On the other hand, Invention V operates by depositing waveguide material to form a dispersion-engineered waveguide.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper. However, within Group I there are a group of patentably distinct species. Therefore if Applicant chooses Group I, he **must** also elect the species.

This application contains claims directed to the following patentably distinct species of the claimed invention within Group I:

1. A first embodiment represented by claims 6 and 10 is drawn towards an optical device, wherein the transmission optical waveguide being of a low-index planar lightwave transmission optical waveguide.
2. A second embodiments represented by claims 5, 9, and 16 is drawn towards an optical device with an optic taper segment being transverse-coupled to the optical device component.

3. A third embodiment represented by claims 11 and 18 is drawn towards an optical device with a multi-layer waveguide structure adapted for integration into an integrated optical device, the multi-layer waveguide structure being adapted for substantially completely transferring optical signal power between the transmission optical waveguide and the multi-layer waveguide structure, the multi-layer waveguide structure being thereby adapted to function as at least one of a passive input coupler and a passive output coupler between the transmission optical waveguide and the integrated optical device.

4. A fourth embodiment represented by claims 12 and 16-20 is drawn towards an optical device that can vary optical loss based on a control signal.

5. A fifth embodiment represented by claims 7, 9, 10, and 11 is drawn towards an optical device, wherein the multi-layer waveguide structure being adapted for passive modal-index matching between the transmission optical waveguide and the multi-layer waveguide structure.

6. An sixth embodiment represented by claims 16 and 17 is drawn towards an optical device with a taper wherein the multi-layer waveguide structure is adapted for active modal index matching with the fiber optic taper segment in response to the control signal.

7. A seventh embodiment represented by claim 28 is drawn towards an optical device where the multi-layer waveguide structure includes a ridge-like waveguide protruding from the substrate.

8. An eighth embodiment represented by claims 35, 39, and 40 is drawn towards an optical device, wherein at least one layer of the multi-layer waveguide structure is provided with a lateral lower index portion.

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9. A ninth embodiment represented by claims 64 and 65 is drawn towards an optical device with a multi-layer waveguide structure, wherein at least one layer includes an aluminum-containing semiconductor.

10. A tenth embodiment represented by claims 60-62 is drawn towards an optical device, wherein the multi-layer structure including alternating higher-index semiconductor and lower index semiconductor layers.

11. An eleventh embodiment represented by claims 66 and 72-74 is drawn towards an optical device, wherein the multi-layer waveguide structure includes at least one semiconductor active layer, at least one semiconductor active layer being an electro-optic, electro-absorptive, or non-linear optic layer.

11. A twelfth embodiment represented by claim 41 is drawn towards an optical device wherein the waveguide structure is substantially perpendicular to the substrate.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1 and 23 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

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Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Conclusion

Applicant is advised that a reply to this requirement must contain an election of Invention I, II, III, IV, or V. If Applicant elects Invention I for examination he **must** also elect a species for examination.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel E Valencia whose telephone number is (703)-305-4399. The examiner can normally be reached on Monday-Friday 9:30-6:00.

The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-7724 for regular communications and (703)-308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.

A handwritten signature in black ink, appearing to be 'dv' followed by a flourish.

dv

January 28, 2003

A handwritten signature in black ink, appearing to be 'John D. Ju'.



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